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09/537,669	03/29/2000	Takeshi Yamamoto	P107317-00003	5975
7590		10/30/2003	EXAMINER	
Nikaido Marmelstein Murray & Oram LLP		AGGARWAL, YOGESH K		
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655 Fifteenth Street NW		PAPER NUMBER		
Suite 330 G Street Lobby		2615		
Washington, DC 20005-5701		3		
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Please find below and/or attached an Office communication concerning this application or proceeding.

KS

## Office Action Summary

**Application No.**

09/537,669

**Applicant(s)**

YAMAMOTO, TAKESHI

**Examiner**

Yogesh K Aggarwal

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 March 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

***Claim Rejections - 35 USC § 102***

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1,2 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Pape et al.  
(US Patent # 5,047,863)

Re claim 1, "an image processing apparatus for processing image data supplied from an image sensor, comprising:

a) "a memory having a first field for storing image data of one frame and a second field for storing position data of a defective pixel of the image sensor;" reads on Pape (col. 3 lines 43-49 figure 1).

b) "control means for controlling image data to write into said memory and image data to read from said memory reads on Pape (col. 4 lines 5-13 figure 1)[ W and R pulses from a control circuit act to write and read the image data into the frame buffer].

c) "a counter for counting the number of pixels of image data sequentially transferred from the image sensor;" reads on Pape (col. 4 lines 50-52)[Clock pulses act as a counter].

d) "and a defect correction circuit for correcting the image data of each pixel sequentially transferred from the image sensor in accordance with image data of pixels adjacent to a pixel whose image data is currently transferred reads on Pape (col. 3 lines 58-62 figure 1 ) [ Pixels are transferred from CID 12 to the defect correction circuit 10 which consists of a frame buffer, register means, a comparator having an output selectively coupled to the register means].

e) "wherein said control means writes the image data corrected by said defect correction circuit in the first field of said memory at a storage location corresponding to the defect pixel, if a count of said counter becomes coincident with a number corresponding to the position data of

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the defective pixel in the second field of said memory, and writes the image data supplied directly from the image sensor in the first field, if the count is not coincident with the number corresponding to the position data of the defective pixel” reads on Pape (col. 4 lines 39-46)[ If the dark pixel data exceeds the threshold, the output register 34 is not clocked (counter). So the current data representation of the prior pixel is read by the read pulse R (control means) and is substituted for the actual data into the frame buffer (memory)].

[Claim 2]

An image processing apparatus according to claim 1, wherein a storage location in said memory is identified by a row address and a column address, the first field stores the image data of each line at a corresponding row address, and the second field stores the position data of the defective pixel at the same row address” reads on Pape (col. 4 lines 30-46). [Lines 30-38 show that if the dark pixel does not exceed the threshold i.e. if it is a good pixel then it is stored in the frame buffer 16 by the write pulse. Lines 39-46 show that if the dark pixel data exceeds a threshold i.e. for a defective pixel a prior pixel is substituted from an output register 34 (part of the memory 16) into the frame buffer 16 by the read pulse (control means) at the same (x, y) location of the good pixel].

[Claim 10]

Claim 10 is a method claim corresponding to the apparatus claim 1. Therefore it has been analyzed and rejected based on the claim 1.

4. Claims 3/1, 3/2, 4-8,11,12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pape et al. (US Patent # 5,047,863) in view of Rambaldi et al. (US Patent # 6618084).

Re claim 3/1, Pape fails to teach "An image processing apparatus according to claim 1, wherein the second field of said memory stores information representative of a single defective pixel or the number of consecutive defective pixels and information representative of a position of the defective pixel in each line". However the above limitations are well known in the art as evidenced by Rambaldi (col. 3 lines 35-38, 49-50).

Therefore taking the combined teachings of Pape and Rambaldi, it would have been obvious to one skilled in the art to incorporate second field of said memory storing information representative of a single defective pixel or the number of consecutive defective pixels and information representative of a position of the defective pixel in each line. Doing so would recall the faulty pixels automatically prior to image generation as evidenced by Rambaldi (col. 3 lines 35-38).

Re claim 3/2, Pape fails to teach "An image processing apparatus according to claim 2, wherein the second field of said memory stores information representative of a single defective pixel or the number of consecutive defective pixels and information representative of a position of the defective pixel in each line". However the above limitations are well known in the art as evidenced by Rambaldi (col. 3 lines 35-38, 49-50).

Therefore taking the combined teachings of Pape and Rambaldi as a whole, it would have been obvious to one skilled in the art to incorporate second field of said memory storing information representative of a single defective pixel or the number of consecutive defective pixels and information representative of a position of the defective pixel in each line. Doing so would recall the faulty pixels automatically prior to image generation as evidenced Rambaldi (col. 3 lines 35-38).

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Re claim 4, Pape fails to teach “An image processing apparatus according to claim 1, wherein said defect correction circuit calculates an average of image data of pixels adjacent to a subject pixel”. However the above limitations are well known in the art as evidenced by Rambaldi (col. 2 lines 13-15).

Therefore taking the combined teachings of Pape and Rambaldi, it would have been obvious to one skilled in the art to incorporate defect correction circuit calculates an average of image data of pixels adjacent to a subject pixel. Doing so would provide a fault tolerant radiation imager such as a CMOS imager as evidenced by Rambaldi (col. 2 lines 10-11).

Re claim 5, Pape fails to teach “ An image processing apparatus according to claim 1, further comprising an external memory, which store position data of defective pixel of the image sensor”. However the above limitations are well known in the art as evidenced by Rambaldi reads on Rambaldi. (Col. 5 lines 33-36 fig. 1).

[The reference says that it may be desirable to include memory 26 on the chip but it may be external too].

Therefore taking the combined teachings of Pape and Rambaldi, it would have been obvious to one skilled in the art to incorporate an external memory, which store position data of defective pixel of the image sensor. Doing so would provide a memory as small as possible yet large enough to store all necessary information for correction/masking for each faulty pixel as evidenced by Rambaldi (col. 5 lines 34-36).

Re claim 6, Pape fails to teach "An image processing apparatus according to claim 1, wherein said memory is a dynamic random access memory". However the above limitations are well known in the art as evidenced by Rambaldi (col. 5 line 48).

Therefore taking the combined teachings of Pape and Rambaldi a whole, it would have been obvious to one skilled in the art to incorporate a memory, which is a dynamic random access memory. Doing so would provide a memory, which can be easily available between the size of 10 kilobits and 1 Megabit as evidenced by Rambaldi (col. 5 lines 44-45).

Re claim 7, Pape fails to teach "An image pickup apparatus including a display device for displaying an image signal processed by the image processing apparatus according to claim 1". However the above limitations are well known in the art as evidenced by Rambaldi (col. 5 lines 25-28).

Therefore taking the combined teachings of Pape and Rambaldi as a whole, it would have been obvious to one skilled in the art to incorporate including a display device for displaying an image signal processed by the image processing apparatus. Doing so would provide for the user to visualize the corrected set of output pixels as evidenced by Rambaldi (col. 5 lines 26-28).

[Claim 8]

An image pickup apparatus according to claim 7, wherein the display device is a liquid crystal display. Official Notice is taken of the fact that both the concept and advantages of providing a LCD as a display device are well known and expected in the art. It would have been obvious to have a LCD as a display device because it has a compact size and good image quality.

Claim 11 is a method claim corresponding to the apparatus claims 2 and 3. Therefore it has been analyzed and rejected based on the claims 2 and 3.

Claim 12 is a method claim corresponding to the apparatus claims 4. Therefore it has been analyzed and rejected based on the claim 4.

5. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pape et al. (US Patent # 5,047,863) in view of Hurst et al. (US Patent # 4654714).

Re claim 9, Pape fails to teach "An image processing apparatus according to claim 1, further comprising a delay circuit for delaying the image data from the image sensor by a time required for a defect correction process, if the count of said counter is not coincident with the value corresponding to the position data of the defective pixel". However the above limitations are well known in the art as evidenced by Hurst (col. 4 lines 15-20 figure 1).

Therefore taking the combined teachings of Pape and Hurst, it would have been obvious to one skilled in the art to a delay circuit for delaying the image data from the image sensor by a time required for a defect correction process, if the count of said counter is not coincident with the value corresponding to the position data of the defective pixel. Doing so would provide a FLAG signal which is timed to occur substantially synchronously with the application to defect corrector 20 of signal from recovery circuit 18 which corresponds to a response from the defective pixel as evidenced by Hurst (col. 3 lines 44-48).

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6. Claims 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pape et al. (US Patent # 5,047,863) in view of Tabei (US Patent # 5805216).

Re claim 13, Pape fails to teach "An image processing method according to claim 10, wherein said step

(d) calculates an average of image data of pixels adjacent to a subject pixel in a row direction". However the above limitations are well known in the art as evidenced by Tabei (col.1 lines 63-65 figure 3A).

Therefore taking the combined teachings of Pape and Tabei, it would have been obvious to one skilled in the art to calculate an average of image data of pixels adjacent to a subject pixel in a row Direction. Doing so would provide a boundary between light and dark portions the place X in which a defective pixel is present is conspicuous as evidenced by Tabei (col. 1 lines 17-20)

Re claim 14, Pape fails to teach "An image processing method according to claim 10, wherein said step

(d) calculates an average of image data of pixels adjacent to a subject pixel in a column direction ". However the above limitations are well known in the art as evidenced by Tabei (col. 2 line 1-2 figure 3D).

Therefore taking the combined teachings of Pape and Tabei, it would have been obvious to one skilled in the art to calculate an average of image data of pixels adjacent to a subject pixel in a column direction. Doing so would provide a boundary between light and dark portions the place X in which a defective pixel is present is conspicuous as evidenced by Tabei (col. 1 lines 17-20).

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Re claim 15, Pape fails to teach "An image processing method according to claim 10, wherein said step

10 (d) performs a weighing process in accordance with distances between pixels adjacent to a subject pixel and the subject pixel". However the above limitations are well known in the art as evidenced by Tabei (col. 6 lines 46-49 figure 12A to 12L).

Therefore taking the combined teachings of Pape and Tabei, it would have been obvious to one skilled in the art to perform a weighing process in accordance with distances between pixels adjacent to a subject pixel and the subject pixel. Doing so would provide interpolation output interpolated by 12 kinds of interpolation methods as evidenced by Tabei (col. 6 lines 39-40).

[Claim 16]

Grounds for rejecting Claim 13 and 14 apply for claim 16 completely. (Dividing a sum of pixel data of two pixels adjacent to a subject pixel and cutting a lowest one bit is the same as dividing the sum of pixel adjacent to each other by two i.e. taking the average of two which is the same as Claim 13 and 14).

### ***Conclusion***

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- US Patent 4,600,946 (Levine et al.)
- US Patent 6,611,288 (Fossum et al.)


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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yogesh K Aggarwal whose telephone number is (703) 305-0346. The examiner can normally be reached on M-F 9:00AM-5: 30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's primary examiner, Vu Le can be reached at (703) 308-6613. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4700

YKA

  
VU LE  
PRIMARY EXAMINER